Specification

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Fabrication method for a thin film semiconductor device, the thin film semiconductor device itself, liquid crystal display, and electronic device.

Field of Technology

The present invention is related to the fabrication method for a thin film semiconductor device, the thin film semiconductor device itself, liquid crystal displays, and electronic devices applicable to active matrix liquid crystal displays and the like.

Background Technology

In recent years, along with increases in screen size and improvements in resolution, the driving methods for liquid crystal displays (LCDs) are moving from simple matrix methods to active matrix methods; and the displays are becoming capable of displaying large amounts of information. LCDs with more than several hundreds of thousands pixels are possible with active matrix methods which place a switching transistor at each pixel. Transparent insulating substrates such as fused quartz and glass which allow the fabrication of transparent displays are used as substrates for all types of LCDs. Although ordinarily semiconductor layers such as amorphous silicon or polycrystalline silicon are used as the active layer in thin film transistors (TFTs), the use of polycrystalline silicon which has higher operating speeds is advantageous for the case of producing monolithic displays which include integrated driving circuits. When polycrystalline silicon is used as the active layer, fused quartz is used as the substrate; and a so-called "high temperature" process in which the maximum processing temperature exceeds 1000°C is used to fabricate the TFTs. On the other hand, for the case of an amorphous silicon active layer, a common glass substrate can be used. For increases in LCD display size while maintaining low costs, such use of low-cost common glass substrates is indispensable. Such amorphous silicon layers, however, have such problems as electrical

5. ☒ Amend the specification by inserting before the first line the sentence:

"This is a ☒ Continuation ☐ Division ☐ Continuation-in-Part of Application No. 09/373,982 filed August 16, 1999, which in turn is a Divisional of Application No. 09/023,695 filed February 12, 1998, now U.S. Patent No. 6,017,779, which in turn is a Continuation of Application No. 08/591,681 filed February 16, 1996, now U.S. Patent No. 5,858,819. The entire disclosure of the prior applications is hereby incorporated by reference herein in its entirety."

6. ☒ Formal drawings (Figs. 1A-5) are attached.

☐ Use Figure for front page of Publication.

7. ☒ Priority of foreign applications No. 6-133374 filed June 15, 1994 and 7-72144, filed March 29,1995 in Japan is claimed under 35 U.S.C. §119 and/or §365(b).

☒ The certified copy was received from the International Bureau in prior Application No. 08/591,681.

☐ A certified copy of the above foreign application(s) is filed herewith.

8. ☐ Priority of U.S. Provisional Application(s) No. _____ filed _____ is claimed under 35 U.S.C. §119.

☐ Amend the specification by inserting before the first line the sentence:

--This nonprovisional application claims the benefit of U.S. Provisional Application(s) No. _____ filed _____.--

9. ☒ The prior application is assigned of record to Seiko Epson Corporation recorded at Reel 7976, Frame 0476.

10. ☐ This application is filed by fewer than all the inventors named in the prior application (37 C.F.R §1.53(b)(1)). Delete the following inventor(s) named in the prior application:

_____ _____

_____ _____

11. ☒ A Preliminary Amendment is attached. Claims added by this Amendment are properly numbered consecutively beginning with the number next following the highest numbered claim in the application.

12. ☒ An Information Disclosure Statement is attached.

13. ☐ Small entity status:

☐ a. Entitlement to small entity status is asserted.

☐ b. Small entity status is no longer claimed.

14. ☐ Other: _____

15. ☐ This application is NOT to be published under 35 U.S.C. 112(b). The undersigned attorney or agent hereby certifies that the invention disclosed in this application has not been and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing.

16. ☒ The power of attorney in the application is to James A. Oliff, Registration No. 27,075, William P. Berridge, Registration No. 30,024, Kirk M. Hudson, Registration No. 27,562, Thomas J. Pardini, Registration No. 30,411, Edward P. Walker, Registration No. 31,450, Robert A. Miller, Registration No. 32,771, Mario A. Costantino, Registration No. 33,565, Stephen J. Roe, Registration No. 34,463, Joel S. Armstrong, Registration No. 36,430, Christopher W. Brown, Registration No. 38,025, and/or Richard E. Rice, Registration No. 31,560.

☐ a. The power appears in the attached Declaration and Power of Attorney.

☐ b. Since the power does not appear in the attached Declaration and Power of Attorney, a substitute Power of Attorney is also attached.